32 degrees of depression. This estimate makes Mount Hood higher than any summit of Europe or North America.

The view from the summit was magnificent. From south to north the whole line of the Cascade Range is at once under the eye, from Diamond Peak to Ranier, a distance of not less that 400 miles. Within that distance are Mounts St. Helen's, Baker, Jefferson, and the Three Sisters; making, with Mount Hood, eight snowy peaks. Eastward the Blue Mountains are in view, and lying between us and them are the broad plains watered by the Deschutes, John Day's, and Umatilla rivers. On the west the piny crests of the coast range cut clear against the sky, with the Willamette Valley sleeping in quiet beauty lying at their feet. The broad silver belt of the Columbia winds through the evergreen valley towards the ocean. Within these limits is every variety of mountain and valley, lake and prairie, bold beetling precipices and graceful rounded summits blending and melting away into each other. It was with reluctance that at length we took the first step down the declivity.

The descent to the great crevasse, though much more rapidly accomplished, was quite as perilous as the ascent from it. We were now approaching the gorge, and a mis-step might precipitate us into unfathomed depths. Less than half an hour was sufficient to retrace the weary climbing of two hours, and standing for a moment on the upper edge of the chasm, I bounded over it where it was 8 feet wide. The impetus of the leap sent me sliding a long distance down the icy steep below.

In two hours and a half from the summit we were in our camp. At dark we began to pay the price of our day's work. The glare of the sun on the ice had burnt our faces and affected our eyes until they became so painful that we could not sleep. I kept on my eyes and face all night a cloth wetted in ice-water, and in the morning was able to see, but two of the party were quite blind for forty-eight hours.

Olympia, Washington Territory, U. S.,
10th Nov., 1866.

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2. *A Journey across the Cascade Mountains into Eastern Oregon and a Description of Idaho Territory.* By ROBERT BROWN, Esq., F.R.G.S.

[Extracts.]

THE Oregon of to-day is not in geographical extent the same as previous to the Ashburton Treaty of 1846, when it was not very distinctly defined, stretching from the Californian boundary up to near

the Russian possessions. At that period all the country south of 49° N. lat., or the Straits of De Fuca, was declared to be United States' territory, and all north of that to the Russian boundary, or what is known as British Columbia and Vancouver Island, to belong to the crown of England.

Then, with increasing population flowing into the rich valley of the Willamette, the territory of Washington in 1853 was separated from Oregon; but, what with Indian wars and other adverse circumstances, its population has somewhat decreased, and does not number more than between 11,000 and 12,000. The country east of the Cascades is thinly populated, save by Indians, and the region to the west of that range is for the most part very thickly wooded, and in some cases very wild and inaccessible.

The territory of Idaho ("Star of the Mountains") was organised out of portions of Washington, Nebraska, and Dakota. For the most part it is a mere desert, and, with the exception of the rich bottoms of the numerous rivers, the wealth of the country consists in the gold and silver mines. It is terribly harassed by Indians, little explored, its civilised population very floating, estimated at about 22,000, and its area about 326,333 square miles. It is a rich mining region, and is likely eventually to become of importance. Three years ago a portion of California, comprehending the region of the Sierra Nevada and the great silver-mines of Washoe, was erected into the state of Nevada. We must not, however, allow ourselves to be misled by the division of these wild countries into counties, &c.; some of the counties having no population, or so little as to be of very small moment, and not a few of the "cities" consisting of a tent, two dogs, and a bob-tailed horse,—as a city which I discovered on the Columbia River last summer did! The state of Oregon proper contains about 60,000 people (a portion very migratory), and an area of about 82,248 square miles, or 60,958,720 acres. This population is principally contained in the beautiful valleys of the Willamette, Umpqua, Rogue River, and Lower Columbia, to the west of the Cascades, and in the little towns on the Upper Columbia to the east. Portland,* on the Willamette, with 8000 inhabitants, is the largest town.

Magnificent steamers navigate the Columbia, with occasional breaks, into the British possessions, and the Willamette at all seasons to Oregon "city," 10 miles above Portland. At high water they navigate the river above the falls for between 200 and 300 miles, to a few miles above the town of Eugene.

* Salem, a small town (lat. 44° 56′ 51″ N, long. 122° 53′ 43″ W.) is, however, the capital.

The whole country east of the Cascade Mountains is very wild, inhabited almost entirely by wild tribes of Indians, and it was over this tract, described on maps as "unexplored," that the descriptions contained in this paper refer. I may explain how it was that I am the historian of it. In July, 1865, I arrived with my Indian servant at Eugene city (lat. 44° 2′ 44″ N.), in the valley of the Willamette, a very out-of-the-way place at best. For the whole summer (indeed, for several summers past) I had been leading a vagabond sort of life among the Indian tribes in the wild country on the Pacific slopes of the Rocky Mountains,—now an explorer, now a naturalist, at one time leading an extensive exploring expedition, at another wandering all alone through the solitary valleys and by the banks of mountain streams.

I proposed from Eugene to cross into the wide region to the east of the Cascade Mountains into the Snake Indian country, confident that my long familiarity with Indian character would render my solitary journey as safe as it had hitherto been from these wild rovers; but on mentioning the subject to my gallant friend General Applegate, I was assured (only in a much more expressive manner) that if I had ten lives and the same number of scalps, instead of only one, I should have barely enough to pay my "footing" in that region! At the same time, for my consolation, I was informed that a party of dragoons were about going over that region as an escort to some gentlemen interested in an attempt to find a route over Eastern Oregon to the territory of Idaho, and that he would use his influence to allow me to travel under their escort.

Thus I travelled to Fort Klamath, where I left the party, and reached Southern Oregon. The rest proceeded over the country to Owyhee River, on much the same track as that explored by Colonel Drew in the preceding year.

In California there are published a number of maps, comprising some attempt at portraying the explored parts; but these are only ephemeral productions, brought out often at great expense to illustrate some newly-discovered gold-mines, and as they are after the collapse of these forgotten, they may be said to be almost unpublished. They are—'Map of the Mining Sections of Idaho and Oregon, showing the Gold and Silver Mines of Boisé and Owyhee, by George Woodman; compiled chiefly from notes of his travels and surveys during the last 18 months' (San Francisco, A. Censoul, 1864) 'Bancroft's Map of Oregon, Washington, Idaho, &c.' (Bancroft, San Francisco, 1864). 'Map of the Territory of Montana with portions of the adjoining Territories, showing the Gulch or Placer Diggings actually worked and Districts where Quartz (Gold

and Silver) lodes have been discovered to Jan. 1st, 1865, drawn by W. W. De Lacy for the use of the first Legislature of Montana' (Censoul, 1865).

On the 17th of July the whole party left the little frontier village of Eugene "city" amid the cheers of the people. For two pleasant days our route lay among the outlying settlements of the Willamette, among rounded knolls, or as they are called here "buttes," * with neat little primitive farms at the base of rocky bluffs, where rough voices hailed us cheerily.

The country was well watered and well wooded, and many were the roaring mountain-creeks we had to cross or swim. Our daily routine was much the same. At daybreak the bugle sounded; then reveillé; all commenced packing up, and the cooks prepared our modest breakfast, of which the inevitable pork and beans formed the staple: the horses were then driven up, every man lassooing his own and saddling it. Then the mules were packed with the usual ejaculations in Spanish and English. Our march was rarely prolonged beyond midday, often camping much earlier, to allow of the overloaded train resting, for the grass, or for convenient camping-places. We spent the rest of the day reconnoitring the neighbourhood for plants, fishing in the mountain-streams, hunting deer through the long, dank, wooded dells, or sleeping under a bush, each as his own individual penchant inclined him, the bugle calling us back to camp for supper; after which each man rolled himself in his blanket under his own particular tree, until the cheery bugle again woke us at daybreak, to make our toilet in those grey misty summer mornings by the banks of some nameless stream, and then to resume our march. The road (such as it was) became worse and worse. We rode through timber and in sight of the middle fork of the Willamette, gliding along between wooded banks of pine and cedar and summer green-leaved maple.

On the 19th we travelled through cañons and thick woods, over many small creeks, and by the banks of the river, with no cultivation. Next day our route lay through dense timber, and after passing a party of Indians making the trail we had to drive our horses before us, scrambling over fallen trees and among rocks up steep inclines, until we came to a point which was named "Point Look-out," where we had great difficulty to get our horses over. Here we encamped, driving our horses across the river. The next eight miles we marched through wooded

* A useful French Canadian voyageur's term to express a rounded elevation too low for a mountain, but too high to be called a hill. This distinction is, however, not strictly adhered to: *e. g.*, Shasta Butte (more than 14,000 feet).

river-bottoms. Swam the river again; climbed a steep mountain trail (for we were now entering among the hills of the Cascade Mountains) and emerged into a beautiful prairie valley, shut in by mountains, but covered with grass, a good creek flowing through it, and with shady woods on the border, so that one might fancy oneself in the "Happy Valley" of Rasselas. The next two days the country was similar, and we encamped (after travelling five miles) on a little prairie.

On the 24th of July the trail lay through woods of fine timber, white and red cedar, and we now noticed for the first time the stately sugar-pine (*Pinus Lambertianus*), the sweet exudations of which are one of the hunter's cathartics. A rhododendron and a honeysuckle (*Lonicera Douglasii*) added variety to the sombre woods, hitherto diversified only by an undergrowth of berry-bushes—the bright salmon-berry flowers, the more modest thimble-berry (*Rubus divaricatus*), and the waxy sal-al (*Gualtheria*), forming an undergrowth like a carpet throughout the woods, and a sure sign of poor stony ground. The stately alder (*Alnus oregonus*), with its dark-green leaves, affected moist ground everywhere, and the hemlock (*Abies Bridgesii*), most graceful of all the north-western conifers, began to disappear from the woods, the silver fir (*Picea grandis*) supplying its place. Now and then we would break through thickets of the mountain laurel (*Ceanothus velutinus*), sending an almost overpowering fragrance from its glistening leaves as we trampled it down under our horses' feet. Amid these pleasant scenes we had a day of disasters; two mules with their loads had rolled over a precipice and were dashed to pieces, and another, after rolling *end over end* (after the manner of mules), had survived and brought its load into camp. Part of the loads were recovered, but a side of bacon up a Douglas pine-tree will remain as a monument of the passing of the first expedition through these mountains. Some emigrants had attempted it in 1853, and we could yet see remains of their disastrous trip, in which some of them died of starvation.

Our track had hitherto been always in a general south-east direction, and to-day it lay by the banks of the middle fork—seeing little but woods and wooded hills of the pass. We saw signs of bears, wolves, and panthers. Deer were seen, and trout abundant. The rocks were all volcanic (trap), and the soil sandy, and, with the exception of the wooded river-bottoms, little fit for cultivation.

We travelled 14 miles before camping, over a fair track with a creek some part of the way, and latterly leading over a country with many steep places, where we had to ride by an almost perpendicular path. In one of these wooded gulches we were met by

a number of Cyuse Indians and a white man, all dressed in most gorgeous array of buckskin and beads, crossing for horses to the Willamette country. The scenery was here very fine. On every side bold wooded mountains, with the headwaters of the Willamette sparkling between the trees, and the snow of Diamond Peak in the distance. On the 28th, after every preparation being made, we commenced the passage of the Cascades into Eastern Oregon. The ascent was comparatively easy, crossing over may mountain-creeks, through woods, where I saw many trees of a species of yew (*Taxus brevifolia*), until the elevation began to be perceptible in the flora,—plants which were long ago in fruit in the valley were here in partial flower, until, as we gained the summit, they were in full bloom. Thickets of rhododendrons with their huge bunches of pink flowers stood out in fine contrast to the drifts of snow, giving one a faint idea of the splendid rhododendron thickets in Sikkim Himalaya, so graphically portrayed by Dr. Joseph Hooker. Occasionally a magnificent species of mountain lily would bloom by the side of some beautiful saxifrage, and the shrubbery of the Ceanothus would add fragrance to the mountain air. The scene from the summit of the pass (4441 feet *) was grand in the extreme. The bold crags of the Diamond Peak with its old crater, and the "Three Sisters" appeared to the north, and on the left, away to the south, the tops of Scott's Peak and Mount Williamson; while the wooded valleys and lesser heights of the Cascade Range lay below, and off to the east the long slope of flat, wooded country, with the peaks of the "Three Brothers," the only break in the monotony of the view. Drifts of snow lay in shady places, and green grassy spots formed halting-places by the side of mountain-streams. Now and then a beautiful mountain-lake, unsuspected before, lay glistening in all its quiet beauty in some unbroken valley. As we began the descent a marked change was apparent in the country. Instead of moist woods, our route lay by an easy descent through groves of a pine thickly scattered over that country (*P. contortus*), encumbered with no undergrowth, and the soil a mass of volcanic ashes and pumice-stone. At 2 P.M. we were right glad, after a weary ride of 26 miles, to reach the headwaters of the Deschutes or Falls River (lat. 43° 27′ 22″ N.). Deschutes River arises by several forks, some of which take their source in the marshes, another in a lake, which we named "Summit Lake" (we had seen it on the right hand in descending) that communicates by a small creek with another 16 miles in length, lower down (named "Crescent Lake"); and this

* This was from the observations of Mr. Byron Pengra, late Surveyor-General, Oregon, and may, I think, be relied on.

is again connected with a third among the mountains, styled, in honour of one of the party, "Lake Oddel." Our camp here was 1200 feet below the summit.

Herons, cranes, and grouse were abundant near the river, but otherwise few birds were seen in this solitary region.

On the 29th of July we began to direct our course in an E.S.E. direction over a level desert flat, with a soil composed of volcanic ashes, and thinly scattered with a forest of *Pinus contortus*, a scrubby-looking tree at best, abounding in resin. To the east and north-east lay a long stretch of flat land, probably 90 miles' breadth, of a similar character to this, but which we found to be impracticable to traverse on account of the almost entire want of water in it. The creeks flowing from the Cascades being lost in "sinks" before going far into this desert track. The "Three Brothers" are the only breaks in this nearly level landscape in that direction, and the snow peaks of the Cascades gleaming through the trees diversify the view to the right, and now and then a cool breeze tempers the hot summer's day as we slowly in long file traverse this wild track. After a march of 11 miles we halted on a branch of the Deschutes River, where we found a tolerably good tract of meadow-land in the immediate vicinity of the river. Deer were plentiful, and the beautiful little humming-birds flitted about among the few flowers which the invigorating moisture allowed to spring up here and there among the long swampy grasses. On Sunday, the 30th July, the track was much as before, only more hilly and varied.

Hitherto, though a sharp look-out had been kept, we had seen no Shoshones Indians, but this evening our scouts came in with very long faces, describing the great moccasin-tracks crossing our trail after we had come into camp, and as every one knows that this was the "sign" of that tribe, we slept with only one eye shut. It was only on our arrival at Fort Klamath that we learned from the Indians there that we had been dogged by three lodges of Snakes the whole of our journey, seeking an opportunity to "stampede" our horses or capture an odd scalp or two, when it could be done without the disagreeable accompaniment of running their heads against a leaden bullet. Once as we crossed Fremont, the "Pathfinders'" trail, the tracks of mocassins and "barefooted" (unshod) horses, with camp-fires not extinguished, began seriously to alarm us. However, we afterwards found that it was the Superintendent of Indian affairs for Oregon on his way with his band of Cyuse scouts to try and make a treaty of peace with Pah-ni-ne.

On the 2nd of August, after travelling 10 miles, we came to a straggling creek with a great extent of rich grasses by its borders,

but the soil very poor and sandy. We named this stream, the only only one for several miles, "Rifle Creek." Scott's Peak was here directly abreast of us, and is a truncated cone of a peculiar form. On the morning of the 3rd of August we were early astir, and, after a march of 7 miles, turned down again to a beautiful prairie near the Klamath Marsh, where the party lay over for several days, and the animals revelled in a paradise of clover. We could see Indians in canoes gathering the pods of the yellow water-lily on the marsh, and tracks of grizzly bear did not make our woodland botanizing anything the pleasanter. Here I bade good bye to my gallant *compagnons de voyage*, from whom I had received so many kindnesses, and, accompanied by Lieut. M'Call and an escort of six troopers, rode over the ridge to the westward, to a fort recently established in Klamath Basin, and supposed to be distant between 15 and 20 miles. We had a pleasant ride over a low ridge—a spur of the Cascades—through a fine grove of yellow pine (*P. ponderosus*), where we shot a skulking coyote wolf (*Canis latrans*, Sag.), and then, descending into a valley where Indian sign was plentiful, until from an eminence the lovely prairie of Klamath Basin—shut in by snowy mountains with cold rivers meandering through, and studded with groves of trees, like wooded islands in a sea of grass—burst upon our astonished view, so long accustomed to the arid tract we had been passing over. We crossed the "Fort Creek," a stream of icy-cold water (which springs out of the ground in one torrent), our horses almost hidden amidst the luxuriant herbage, and then through a mile or two of country which it required recollection of where we were not to suppose some old English park; we arrived at the fort, covered with dust and most unpresentable figures. The valley of Klamath Basin is excellent soil, but cold springs come down from the mountains and render the subsoil so cold that cattle cannot subsist here in the winter, and garden produce, with the exception of beets and turnips, does not come to any size. Down by the borders of Klamath Lake and Sprague's River the snow lies only a short time, and there the Indians winter their stock.

The Snake or Lewis Fork of the Columbia River is navigated during the few weeks of high water by a steamer as high up as Lewiston (so named from the celebrated explorer), but from recent explorations it is found that the valley is entirely different from the mouth of the Boisé down to Old Ferry from what it is below. There is said to be no Snake Valley above Boisé and Owyhee rivers, the Snake, winding its way around low alkaline hills which bear only sagebrush; and there being no grassy bottoms or islands worth

speaking of, only clayey banks of almost dazzling whiteness, the district offers no inducements to settlement. The river is from 200 to 400 yards wide, deep at its mouth, and free from "ruffles;" the current averaging the strength of the Columbia between the Dallas and the Cascades. The Owyhee and Boisé rivers, which debouche into the Snake within a short distance of each other, sensibly increase the volume of water. The limits of this paper being our own personal explorations, it would be out of place to attempt any laboured geographical description of the country outside our track, however little known or (what is worse) erroneously described, yet I cannot leave the Snake River without mentioning the magnificent waterfall discovered on the upper reaches of it. We have received from one of the discoverers a trustworthy account of these grand falls. They were discovered by a detachment of troops scouting in the valley of the river in 1863. The entire volume of the Snake pours over a sheer precipice of 198 feet, 38 feet higher than Niagara. The locality of this immense waterfall is near the point hitherto designated as the Great Shoshow, or Salmon Falls, of that river, but they have always been enveloped in mystery. For hundreds of miles across that great plain, Snake River flows through a cañon with vertical walls. The route crosses from point to point of the bends, only approaching close to the river where there is a chance to descend to the water. From these facts few, if any, of the many adventurers that have "crossed the plains" ever looked upon the Great Falls. The discoverers report, besides the main cataract, many others of less height, varying from 20 to 50 feet each, near by.

The Boisé basin comprises the principal mines which have been discovered in and about the middle portion of Idaho territory. It lies in near lat. 43° N., and is surrounded by very high mountains, from which waters flow into the tributaries of the Snake, the Colorado, and the Missouri. Jefferson's Fork being the principal tributary of the Missouri, Green River of the Colorado, and Snake River of the Columbia. On this stream but little mining has been done, the gold being generally so fine that little exertion has been made to save it: there being good mines near at hand in the basin, and wages rating high. This, together with the fact that sufficient water can only be had about three months in the year, has impeded the progress of mining. Boisé basin may be estimated as being about 25 miles long and 10 miles wide. The gold is not found in strata of earth or gravel, but in leads, many places being marvellously rich; others (as is too often the case with gold-diggings generally) not paying the expense of working. This is

true of all gold mines, that while one man is making a fortune, fifty are ruined: indeed, out of the hundreds of gold miners whom I have known, I cannot recollect ten who have earned more by gold mining than they would have done by any other quieter and less laborious employment in the same country. In this basin there are four villages:—Idaho City, the capital, is the largest; Pioneer City, the second; Placerville, third; and Centreville, fourth. Pioneer City is better known as "Fort Hog'em." Granitic rock forms the basis of these mountains, and is what the miners call the "bed-rock." By sinking down, deposits of washed boulders have been found to a depth of 90 feet. The hills are composed of syenite or granite, blue, whitish, and grey, with occasional eruptions of basalt, serpentine and trap, with strata of metamorphosed clay-slates, and when felspar prevails the soil is generally loose and rich in gold. The quartz veins, running N.N.W. and S.S.E., vary in width, and prove rich on the surface, evidently showing that the gold in the creek, &c., has been disintegrated from them. In many of the ledges, pyrites of iron, antimony, copper, galena, sulphur, arsenic and bismuth occur. Some of these metals are plentiful, but are obnoxious to the quartz millmen, as it is impossible to work the gold-bearing rock sufficiently fine for successful amalgamation, when having to contend with these baser metals. The valley of Boisé River has two benches or raised terraces. The lower shows marks of inundation, and is in places moderately fertile. The upper is dry sandy soil, with no available ground to cultivate at all. The valley is only calculated to raise vegetables enough to supply the mining camps around. It will never yield a large quantity of hay or grain. Last winter (1864-5) the thermometer sank many degrees below zero. The rivers are belted with cotton-wood trees, but not heavily. The confluence of the Boisé with the Snake River is about 40 miles below Boisé "City."

The PRESIDENT informed the meeting that Mr. Brown, who had brought Mr. Hines' paper to England, and enlarged it by remarks of his own, was a most able botanist, and had travelled for several years in the countries of western North America. He had himself witnessed Mount Hood in a state of activity. With regard to the subject of the second Paper, the meeting would recollect that some years ago, Colonel Fremont traversed the Cascade chain, in his explorations of the then almost unknown Pacific regions of North America. The route taken by Mr. Brown, as described in the paper, was, however, quite a new one, and the ground traversed different from that described by Fremont. The paper was a long one, and composed of several distinct narratives relating to the country between Oregon and the territory of Idaho, but the remainder of it could not be read that evening.

Mr. BROWN said that the Cascade range of mountains traversed the British possessions, Washington Territory and Oregon, from north to south, and were a continuation of the Sierra Nevada of California. Further to the south, the

ranges were connected by the spurs of the Siskiyou. The range was more important even than the Rocky Mountains, as far as concerned the physical geography of North America, because, while the climates on the immediate eastern and western sides of the Rocky Mountains were very similar, and the plants and animals almost identical, the plants, animals, and climate on the sides of the Cascade Mountains were very dissimilar. The soils were also totally different in character on the two sides of the range. The soil on the western side was rich and fertile, and a portion of it was thickly wooded. Many districts were cultivated, and in fact almost the whole population of Oregon, comprising 50,000 or 60,000 people, were found in the valleys of the west; whereas, on the eastern side the soil was poor and the country arid, and there was no cultivation except in such valleys as that of Deschutes, which was well watered. The cause of the western side of the range being more fertile than the eastern, was that the mountains caught the warm breezes from the Pacific, and precipitated the moisture over that region. The Cascade Mountains had all been more or less active volcanoes, and some of them were active to this day. He had occasion in exploring the range to visit the old craters, and he found that several of them had deep lakes like the Gemunder Māar in the Eifel, the Pulvermaar, the Murfel der Maar, &c. Mount Hood was an active volcano. In October, 1865, there was a severe earthquake in California, which was felt all over the west coast. He had occasion to make, with the assistance of a friend, some observations upon this mountain near the Columbia River. He arrived there in October, just after the earthquake, and though he himself did not see any eruption in which fire was visible, yet his friend observed some flames. On the day after their arrival they saw smoke issuing from the mountain in large volumes, and in the afternoon of the same day there emerged large volumes of steam, occasionally mixed with black smoke. The next day the emissions consisted almost entirely of steam. This steam formed into clouds, and drifted away to the horizon. The day following that was wet, probably in consequence of the steam which had escaped from the volcano. During the following winter, the snow covered the whole mountain, and Mr. Hines' ascent was made after that. But in the summer of 1866, black smoke was again seen issuing from Mount Hood. He had just received a letter from the North-west Coast, stating that on a very clear day smoke had been seen recently coming out of the mountain. Mount Rainier was seen in eruption in 1842; and Mount St. Helens in 1842 sent out showers of ashes, and General Fremont mentioned that he saw some of the ashes. In reference to Mount Baker, that mountain could be seen very well from the town of Victoria, Vancouver Island, and the colonists viewed it with very great pride. Its height had not been exactly ascertained, but it was supposed to be between 10,000 and 11,000 feet. He made an attempt to ascend it in August, 1866; but, after going for five days into the interior of the country, the Indians would not allow his party to proceed; but some of the party afterwards succeeded in reaching nearly to the summit, and saw streams of lava. In 1863 flames were seen coming out of Mount Baker; and he was told by Sir James Douglas that in former years he had seen flames issuing from the summit. He (Mr. Brown) was told by trustworthy observers that, in the summer he ascended, flames were seen at night, but the eruption was not of a very decided character. He had seen lava and pummice-stone in the adjacent stream.

Mr. DALLAS, late Governor of Prince Rupert's Land, said he agreed with the general description of the country given by Mr. Brown. He had, however, been rather amused by the apprehensions entertained by the American officer of an attack from Indians, and by the commanding officer warning Mr. Brown, on entering the country, that he would have need of ten scalps. He (Mr. Dallas) had traversed a large portion of the country, and

travelled amongst the most hostile of the Indians, namely, the Blackfeet and the Sioux, without any fear. He wished to call attention to the remarkable fact that all over North America, wherever the British rule prevailed, there had been scarcely any instance of disturbance or collision with the Indian tribes. He did not think that could be said of any other part of the world where we had come into contact with the natives of the country; he could instance the Cape of Good Hope and New Zealand. He attributed this exceptional result in the case of the North American Indians to the tact and management of the early pioneers who inaugurated the system, which had been always maintained by the Hudson's Bay Company, namely, under all circumstances to maintain friendly relations with the Indians. Even in cases where aggressions and raids had been made by them, though we had always punished them, yet we had done so in accordance with their own ideas and customs, and had generally been successful in carrying their convictions with us. This fact of the immunity of British subjects among the tribes of the Indians was remarkable, and spoke very much in favour of the management of those who have had the rule of the country; while, as regarded Americans, it had never been safe for anyone to travel the country as an American.

Sir EDWARD BELCHER said he must congratulate the Society on receiving a paper from persons who had been brave enough to ascend the snowy peaks of the Cascade Mountains; but he should have felt much better satisfied if the paper had given the data upon which the altitude of Mount Hood had been deduced. Passing up and down the Columbia River he had seen these mountains, but, as far as his own estimate went, he should consider that Mount St. Elias, which he had also seen, was infinitely higher than the mountains of the region described. There could be no question about that.* St. Elias was the father of the icebergs of that icy sea. The ice had been seen slipping down the mountain, and actually calving its bergs into the sea. At the time he passed Mount Hood it did not strike him as a very lofty mountain. He estimated its altitude from Fort Vancouver, having no second position which would give a proper basis for determining the height; but one curious fact was that Mount Hood was not seen from the sea. It was not so high as to allow of its being seen over the outer ridge of mountains, and therefore he could not imagine that it was of the altitude which had been stated. He could most clearly bear out all that Governor Dallas had stated with regard to the safety of British subjects among the Indians. He (Sir E. Belcher) had mentioned, in a work which he had published, the case of a hunter named McLeod, who, with no company but his wife, travelled right through the mountains to the Indian settlements and back again, without any harm happening to them. Some Americans who followed and attempted the same route, not being British subjects, were stopped, and, he believed, murdered by the Indians. Signs of former volcanic action had long ago been observed near the mouth of the Columbia River, in the great quantities of pumice-stone found there, and as far as the sandy beaches extended. The River Willamette was the centre of the district in which the Governor of Vancouver Island had allowed a party of Americans to establish themselves in 1838 or 1839. It was a very rich country. He had no doubt that the Western coast, wherever the sea-breezes reached, would prove well adapted for cultivation. He very much doubted that any of the land on the Eastern side would be productive. For instance, on the banks of the Sacramento, for a distance of upwards of 96 miles as the crow flies, although the banks were alluvial and there was a great depth of soil, nothing would grow except the coarsest grasses.

Mr. CASELLA stated that the deduction made with regard to the altitude of

* No *decided* determination of the *height* of Mount St. Elias has been arrived at: whence then the assertion that Mount Hood is higher?—E. B.

Mount Hood, by the author of the paper, was correct, if the data were correct. It was stated that on the summit of Mount Hood the temperature of boiling water was 180°. That would be equal to about 16 barometrical inches, each inch being equal to 1000 feet, which would give an elevation of about 17,500 feet. If the instruments used were correct, there could be no doubt that the elevation would be as near as possible what had been related.

Sir EDWARD BELCHER replied that, with a set of instruments specially adapted for observation of the boiling-point, it was found that the calculations were in some cases as much as 2000 feet in excess, as compared with trigonometrical survey.

Mr. CASELLA said that there might be variations and deviations; but the thermometer as an instrument for measuring altitudes stood inferior only to the barometer itself, besides the advantage of being so much more portable.

Mr. W. L. BOOKER (Her Majesty's Consul at San Francisco) said that about fifteen or sixteen years ago California was the only part from which the gold of North America was exported. At that time the quantity of gold received at San Francisco probably amounted to twelve or thirteen million pounds sterling. California did not yield nearly so large an amount as it did formerly; but the enormous amount of territory opened up by gold miners and others afforded a larger total yield of gold than was produced in California ten years ago. He had no hesitation in affirming that the quantity of gold yielded on the western slope of the Rocky Mountains was more now than it was seven or even ten years ago. A great deal more was absorbed in the country itself; but the exports from San Francisco were about as large as they ever were. From its geographical position, San Francisco must always be the port for the whole of the western part of North America.

The PRESIDENT asked whether the region which was so particularly auriferous in the first instance had not been pretty well exhausted of gold.

Mr. BOOKER replied that the Placer mines were all nearly exhausted. The gold was now got in California from quartz mines and from the mountains by washing them down by hydraulic pressure, and although the yield was probably very small to the ton of earth, still by the use of a huge pressure of water thousands of tons could be washed with the same facility as 50 or 100 tons formerly. He could not speak of the gold yield of the Cascade range of mountains; but in 1859 silver was discovered in the Nevada territory. He believed that about 2,400,000 pounds sterling was the average produce of the Territory (now State). There was an intermixture of gold with this, and the metal was worth on an average about 20s. or 24s. the oz. From Idaho, Washington Territory, and British Columbia, between three and four million pounds sterling of gold and silver, but chiefly gold, were annually brought down. Oregon had always been a very good agricultural district; but not being so thickly populated as California, the produce was not so large. Twelve years ago California was an importer of grain; but this year they had nearly a million quarters of wheat for export over and above the wants of the country. The oats produced in Oregon were unquestionably the finest in the world. He had seen oats weighing 52 lbs. to the bushel brought from Oregon by the ship-load. The barley was not so good either in Oregon, California, or Washington Territory. It was what would be termed in England "grinding barley," although it was used for malting. Gold had been discovered on both sides of the Rocky Mountains: it came to San Francisco from the west slope, and not from the eastern slope at all. Montana, Washington, Oregon, Idaho, down as far as the Mexican frontier, were all more or less gold-producing. In the southern part of the State of California, 150 miles south of San Francisco, almost all agriculture ceases. That was a grazing country, but not so good as had been supposed, owing to its being subject to great droughts: three or four years ago more than half the cattle and a third of the

sheep were destroyed by this cause. The Sacramento Valley, and to the south of San Francisco, a district pronounced many years ago by Governor Douglas as unfit for growing grain, were very fertile, and the latter had proved of late years to be the very best grain-growing country. He (Mr. Booker) had seen lands, not more than 60 miles south of San Francisco, which had produced 80 bushels of wheat and 120 bushels of barley and oats to the acre. A portion of the country consisted of steppes. The district near the sea produced the largest returns, and the land gradually became less fertile the higher it was, until at last it was fit only for grazing land. The neighbourhood of the geysers was the finest agricultural country in the world, consisting of narrow valleys, with rivers or creeks running through them. These valleys afforded magnificent views to those who were in search of scenery, and plenteous crops to those who were in search of the rewards of husbandry. Last spring he ascended Mount St. Helens, near the Geysers. The height was about 4600 feet, and the ascent was very easy by means of a pathway through the brushwood. The top of the hill was a region of stunted pines, not one of which exceeded 10 feet in height, and bearing large cones. The top of the hill afforded a view which he did not think could be easily surpassed.

ADDITIONAL NOTICE.

(Printed by order of Council.)

On the Sources and Course of the Lycus and other Rivers in Kurdistan. By J. E. Taylor, Esq., Her Majesty's Consul at Diarbekr.*

(Communicated by Captain Felix Jones.)

My dear Captain Jones,— Feb. 2, 1867.

I send you a rough map of my last journey and routes from Erzeroum to Kára Hissar round to Arab-Kír; thence to Khozat and through the Deyrsím to Kamach and Erzingán; from there again, but by another line, through the Deyrsím to Khozát; thence to Mazgerd or Hormuzgerd on to Peyrtek and Kharpút.

The interest of this route consists in my having satisfactorily traced the Kalkyt, Degirmen, or Kara Sú (the Lycus), from its source down to the point where it is generally known near Koinloo Hissar, as also its principal tributary the Koát or Kara Hissar Sú. The real source and early course of the Kizzel Irmák or Halys has also been visited and fixed. It rises at the foot of the high centre peak of the Kizzil-dagh; hence its name. Subsequently I followed the Mezoor Su and the river of Tchimishgezek, both of which are one with the Chigneyr Su, and they are now for the first time laid down with something like exactitude. Independent of these new notices, I think I have supplied a tolerably correct sketch of a great part of the Deyrsím Dagh, a range of huge mountains only to be penetrated at three points from the north, viz.—by the narrow passes of the Ziáret, Harámí, and Merján Boghází. The first I followed on my way to

* The details of Mr. Taylor's discoveries, with his map, will be published in the Journal vol. xxxvii.